## Trig Final (Practice v42)
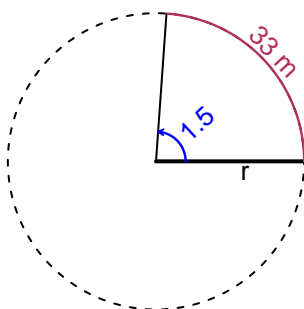
- You can use a calculator (like Desmos)
- You should have a unit-circle with special angles and coordinates marked.
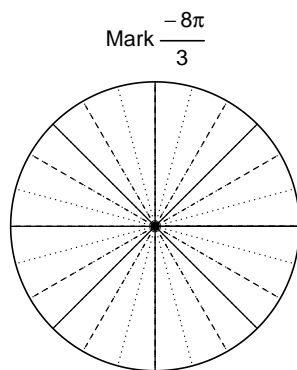
### Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The arc length is 33 meters. The angle measure is 1.5 radians. How long is the radius in meters?
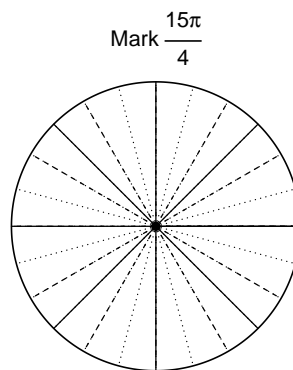


### Question 2

Consider angles $\frac{-8\pi}{3}$ and $\frac{15\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\sin\left(\frac{-8\pi}{3}\right)$ and $\cos\left(\frac{15\pi}{4}\right)$ by using a unit circle (provided separately).

Mark $\dfrac{-8\pi}{3}$



Find $\sin(-8\pi/3)$

Mark $\dfrac{15\pi}{4}$



Find $\cos(15\pi/4)$

**Question 3**

If $\sin(\theta) = \frac{-60}{61}$, and $\theta$ is in quadrant IV, determine an exact value for $\cos(\theta)$.

**Question 4**

A mass-spring system oscillates vertically with an amplitude of 2 meters, a frequency of 6.26 Hz, and a midline at $y = 3.05$ meters. At $t = 0$, the mass is at the midline and moving up. Write an equation to model the height ($y$ in meters) as a function of time ($t$ in seconds).